CLAIMS

1. A filler-affixed fiber comprising a fiber, a binder resin on the fiber surface, and a filler affixed to the binder resin, wherein

the binder resin is heat-and-humidity gelling resin that is caused to gel by heating in the presence of moisture, and

the filler is affixed by a gel material produced by causing the heat-and-humidity gelling resin to gel.

2. The filler-affixed fiber according to claim 1, wherein the heat-and-humidity gelling resin is ethylene-vinyl alcohol copolymer resin.

3. The filler-affixed fiber according to claim 1, wherein the average particle diameter of the filler is in a range of 0.01 to 100 μm.

4. A fiber structure comprising a filler-affixed fiber including a fiber, a binder resin on the fiber surface, and a filler affixed to the binder resin, wherein

the binder resin is heat-and-humidity gelling resin that is caused to gel by heating in the presence of moisture, and

the filler is affixed by a gel material produced by causing the heat-and-humidity gelling resin to gel.

5. The fiber structure according to claim 4, wherein the heat-and-humidity gelling resin is ethylene-vinyl alcohol copolymer resin.

6. The fiber structure according to claim 4, wherein the fiber and the binder resin have at least one combination selected from among

(I) conjugate fiber that includes a heat-and-humidity gelling resin component and another thermoplastic synthetic fiber component,

(II) a mixture of the conjugate fiber and another fiber,

(III) a mixture of the conjugate fiber and heat-and-humidity gelling resin, and

(IV) a mixture of heat-and-humidity gelling resin and another fiber.

7. The fiber structure according to claim 4, wherein the average particle diameter of the filler is in a range of 0.01 to 100 μm.

8. The fiber structure according to claim 4, wherein the filler is inorganic particles.

9. The fiber structure according to claim 8, wherein the inorganic particles are at least one selected from alumina, silica, tripoli, diamond, corundum, emery, garnet, flint, synthetic diamond, boron nitride, silicon carbide, boron carbide, chrome oxide, cerium oxide, iron oxide, colloid silicate, carbon, graphite, zeolite, titanium dioxide, kaolin, clay, and silica gel.

10. The fiber structure according to claim 9, wherein the filler is an abrasive, and the fiber structure is an abrasive nonwoven fabric.

11. The fiber structure according to claim 4, wherein the filler includes porous particles.

12. The fiber structure according to claim 11, wherein the porous particles are activated carbon particles.

13. The fiber structure according to claim 12, wherein the fiber structure is in the form of gas adsorbent material.

14. The fiber structure according to claim 12, wherein the fiber structure

is in the form of water purifying material.

15. The fiber structure according to claim 4, wherein the filler-affixed fiber is present on both surfaces, and hydrophilic fiber is present inside.

16. The fiber structure according to claim 15, wherein the hydrophilic fiber is at least one fiber selected from rayon fiber, cotton fiber, and pulp.

17. The fiber structure according to claim 4, wherein the fiber structure is compression molded and affixed in the direction of thickness.

18. A fiber molded body made by molding a fiber structure including a fiber, a binder resin on the fiber surface, and a filler-affixed fiber affixed to the binder resin, wherein

the binder resin includes heat-and-humidity gelling resin that is caused to gel by heating in the presence of moisture, and

in the fiber structure, the fiber is fixed by a gel material produced by causing the heat-and-humidity gelling resin to gel under heat and humidity, and the fiber structure is molded in a predetermined shape.

19. The fiber molded body according to claim 18, wherein the fiber molded body is molded by contact pressure mold processing.

20. A method for producing a filler-affixed fiber including a fiber, a binder resin on the fiber surface, and a filler affixed to the binder resin, wherein

the fiber and the binder resin are heat-and-humidity gelling fiber that is caused to gel by heating in the presence of moisture,

a filler-dispersed solution in which the filler is dispersed in a solution is provided to the heat-and-humidity gelling fiber, and

next, the heat-and-humidity gelling fiber is caused to gel by

performing heat-and-humidity treatment on the heat-and-humidity gelling fiber in a heat and humidity atmosphere, so that the filler is affixed to the fiber surface by gel material.

21. The method for producing a filler-affixed fiber according to claim 20, wherein the heat-and-humidity gelling fiber is conjugate fiber that includes heat-and-humidity gelling resin alone, or a heat-and-humidity gelling resin component and another thermoplastic synthetic fiber component.

22. The method for producing a filler-affixed fiber according to claim 20, wherein the heat and humidity atmosphere has a temperature range from not less than the gelling temperature of the heat-and-humidity gelling resin to not more than the melting point minus 20°C.

23. A method for producing a filler-affixed fiber including a fiber, a binder resin on the fiber surface, and a filler affixed to the binder resin, wherein

the fiber and the binder resin are another fiber and heat-and-humidity gelling resin,

filler is provided after the heat-and-humidity gelling resin has been provided to the other fiber, or a filler-dispersed solution in which the filler and the heat-and-humidity gelling resin are dispersed in a solution is provided to the other fiber, and

next, the heat-and-humidity gelling resin is caused to gel by performing heat-and-humidity treatment in a heat and humidity atmosphere, and the filler is affixed to the surface of the other fiber by gel material.

24. A method for producing a fiber structure containing a filler-affixed fiber including a fiber, a binder resin on the fiber surface, and a filler affixed to the binder resin, wherein

the binder resin is heat-and-humidity gelling resin that is caused to

gel by heating in the presence of moisture,

the fiber and the binder resin are at least one combination selected from among

(I) conjugate fiber that includes a heat-and-humidity gelling resin fiber component and another thermoplastic synthetic fiber component,

(II) a mixture of the conjugate fiber and another fiber,

(III) a mixture of the conjugate fiber and heat-and-humidity gelling resin, and

(IV) a mixture of heat-and-humidity gelling resin and another fiber,

a fiber structure is produced with the fiber and the binder resin,

a filler-dispersed solution in which the filler is dispersed in a solution is provided to the fiber structure, and

next, the heat-and-humidity gelling resin is caused to gel by performing heat-and-humidity treatment on the heat-and-humidity gelling resin in a heat and humidity atmosphere, so that the filler is affixed to the fiber surface by gel material, forming a filler-affixed fiber.

25. The method for producing a fiber structure according to claim 24, wherein the heat and humidity atmosphere has a temperature range from not less than the gelling temperature of the heat-and-humidity gelling resin to not more than the melting point minus 20°C.

26. The method for producing a fiber structure according to claim 24, wherein the heat-and-humidity treatment is a treatment of performing compression molding in the direction of thickness.

27. The method for producing a fiber structure according to claim 24, wherein the heat-and-humidity treatment is a treatment performed with steam.

28. The method for producing a fiber structure according to claim 24, wherein the filler-dispersed solution is an aqueous solution or an aqueous solution that includes a heat-and-humidity gelling resin.

29. A method for producing a fiber molded body made by molding a fiber structure including a fiber, a binder resin on the fiber surface, and a filler-affixed fiber affixed to the binder resin, wherein

the binder resin includes heat-and-humidity gelling resin that is caused to gel by heating in the presence of moisture,

a fiber structure including the fiber and the binder resin is produced, and

heat-and-humidity mold processing is performed on the fiber structure in a metal die by causing the heat-and-humidity gelling resin to gel under heat and humidity in a heat and humidity atmosphere.

30. The method for producing a fiber molded body according to claim 29, wherein the heat-and-humidity mold processing is processing in which a fiber structure that includes moisture and filler is inserted into a pair of metal dies, and a heat-and-pressure treatment is performed.

31. The method for producing a fiber molded body according to claim 29, wherein the heat-and-humidity mold processing is contact pressure mold processing in which processing is performed with a pressure at which the fiber structure and the metal dies make contact.